DOCUMENT RESUME

ED 304 264 RC 016 979

AUTHOR Johnson, Victoria Anne; And Others
TITLE Macy BioPrep Project: Preliminary Analysis of Student Questionnaires.
PUB DATE Nov 88
NOTE 18p.; Paper presented at the Annual Meeting of the Mid-South Educational Research Association (Louisville, KY, November 8-11, 1988).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Attitude Change; *Behavior Change; *Biomedicine; *College Preparation; Comparative Analysis; Mathematics Education; Medical Education; Minority Group Children; Nontraditional Education; Program Evaluation; Rural Areas; Rural Education; Secondary Education; Speech Communication; *Student Attitudes; *Student Behavior; Writing Skills
IDENTIFIERS Alabama; *Biomedical Sciences Preparatory Program AL; Minority Participation Program

ABSTRACT

This paper reports on a study of the Biomedical Sciences Preparation Program (BioPrep), a rural component of the Josiah Macy Jr. Foundation's funded projects. The program was intended to give Alabama students (particularly minorities) academic competency in mathematics, science, and oral and written communication relevant to medical professions. Students were selected for BioPrep in the 9th grade and continued participation through the 12th grade. One goal of the program was the development of student appreciation for rural medical practice. The students are exposed to field placements, directed and independent studies, laboratory work, Saturday sessions, accelerated curricula during school, and full-time summer programs. The purpose of this study was to examine related attitude and behavioral changes that may be attributable to the BioPrep Program. Questionnaire responses from BioPrep students were compared with those from a control group. Students were questioned on sources of information, school-related activities, family relationships, health care, careers, and attitudes toward rural living. The overall results of the analysis do not support a strong advantage for either the BioPrep or the control group, possibly because BioPrep was designed for academic-not behavioral or attitudinal-outcomes. Also, with so many outside variables competing for adolescents' attention, it is difficult to devise a program that will change attitudes or to adequately measure changes that do occur. Participation in BioPrep also may have presented problems for students in other areas of their lives. The data were inconclusive about the program's effects on students' behaviors, suggesting a need for a more in-depth evaluation. (TES)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED304264

MACY BIOPREP PROJECT: PRELIMINARY ANALYSIS OF STUDENT QUESTIONNAIRES

Victoria Anne Johnson, Prince C.O. Chukabarah, and Brad Chissom
The University Of Alabama

Presented At The Annual Meeting Of The Mid-South
Educational Research Association
Louisville, Kentucky
November 8-11, 1988

RC016979

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Brad Chissom

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

MACY BIOPREP PROJECT: PRELIMINARY ANALYSIS OF STUDENT QUESTIONNAIRES[1]

Introduction

The Biomedical Sciences Preparation Program (BioPrep) is an interventional action program established in the College of Community Health Sciences at The University of Alabama, Tuscaloosa campus. It is an experimental program whose major purpose is to "develop rural disadvantaged Alabama high school students academically and socially so that they will be motivated and able to seek admission to and progress successfully through college, specifically in prehealth professional, or biomedical sciences curricula" (Knopke & Northrup, 1985, p. 2). An ancillary purpose of the program is to nurture in the student participants an enduring desire to go back to the rural areas of Alabama after their professional graduation, and to establish and practice their health professions there.

The BioPrep project in Alabama is the rural component of the Josiah Macy, Jr. Foundation's funded projects aimed at "providing academic preparation at the high school level that will enable students, particularly minorities, to pursue successfully higher education that will lead to careers in the medical and biomedical fields" (Knopke & Northrup, 1985, p. 3). Urban counterparts to the project have been implemented in New York City, Arizona, New Haven, and The Bronx. In Alabama the project is operated in five high schools in Greene, Hale, and Tuscaloosa counties, which all identified as rural.

The high school student participants in the Alabama BioPrep program were expected, at the completion of the program, to have acquired the necessary requisite scholastic background for admission to a college/university such

---

[1]The authors express appreciation to Dr. H.J. Knopke and Ms. J.S. Hartman of the BioPrep Program for their assistance with this project.

that the student would be able to complete the chosen undergraduate curriculum successfully. The students were also expected to have developed adequate academic competencies in mathematics, science, and oral and written communication relevant to the medical and biomedical professions. Furthermore, the students would develop sufficient understanding of the nature and mechanisms of the health care system and professionalism. A very important component of the goals of the BioPrep program and expectations from its graduates is the development of an appreciation of traditional values of living and practicing their professions in rural regions when they, the students, have obtained their professional training and certifications.

Selection of the pilot-group of high school student participants in the BioPrep program was done jointly by the project staff, school systems, central office personnel, principals, counselors, and eighth-grade teachers. Student performance in the seventh and eighth grades as well as the students' California Achievement Test Scores were the major objective standards/measures used in the selection. In general, the selection process ensured that the chosen students had both high academic skills and personality characteristics reflective of their potential professional competence, sensitivity to and appreciation for life and health care problems in rural regions (Knopke & Northrup, 1985).

The scope of overall course work and other related Bioprep activities were summarized by Knopke, Hartman, and Northrup (1986) as follows:

> The course work and other activities of the program have focused primarily on the science, mathematics, and language/communication competencies needed for university admission and subsequent academic success. Interwoven with these have been instruction and experiences in the elements and processes of the health care system and the values of rural life. The special accelerated curricula have been conducted during regular school hours, during block time, and have included directed and independent study, tutorials, and

> significant laboratory work. Field placements and bimonthly special Saturday sessions on The University of Alabama campus and other locations, and full-time summer programs constitute complementary activities that have taken place outside the normal school hours. (p. 3)

A control group was selected from non-participating schools that were comparable to the participating schools in terms of socio-economic, cultural, and demographic characteristics. The same selection procedures were used for both the control and experimental groups of students. The BioPrep group has been shown in preliminary results to achieve higher ACT scores than the control group on all measures except on the Social Studies scale (Knopke, Hartman, & Northrup, 1986). The BioPrep group also chose professional careers earlier and more frequently than the controls. In fact, the BioPrep students' early and more frequent choice of professional health careers was very similar to those of pre-medical and junior medical students (Knopke, Northrup, & Hartman, 1986).

Purpose

While the preliminary analysis of results indicated that the BioPrep students achieved greater academic success and were more interested in the health profession than the control group, the purpose of this study was to examine related attitude and behavior changes that may be attributable to the BioPrep Program. At the inception of the program, in-house instruments were developed to assess student attitudes toward themselves as students, family /community members, and as potential professionals. This study examines some of the vast amount of data collected through these instruments in an attempt to (1) define some general areas of change and (2) suggest future directions for research and evaluation.

Method

Subjects. Students who participated in the BioPrep Program (n=101) were

compared with a control group (N=88) of students who were selected before the program began. Students were selected for participation beginning in the ninth grade and continued in the program until the twelfth grade. Attrition was relatively low at approximately 15%.

Materials. Data for this study were collected using before and after questionnaires administered to the BioPrep and control students by project staff. The questionnaires solicited extensive information from the students in six areas: (1) sources of information (such as TV, magazines, and newspapers), (2) school-related activities, (3) family relationships, (4) health care, (5) careers, and (6) attitudes toward rural living. Some of the questions requested a response on a Likert-type scale, while others requested a report of behaviors.

Data Analysis. In order to determine if the changes that occurred in these areas were different for the two groups, two types of statistical analysis were performed. If several questions were used to measure an attitude or behavior, the answers were summed and the total score used as a measure of the attitude or behavior. A t-test was used to determine if there was a difference in change of attitude or behavior between the groups. If an attitude or behavior was measured with a single question, each group was divided into those whose attitude after the program was (1) more positive, (2) less positive, and (3) the same as before the program. Chi-square was used to determine if there was a difference in change of attitude or behavior between the groups. Since the purpose of the study was do a preliminary analysis and provide more insight into the results for future research and evaluation and there was not a concern regarding Type I errors, both types of analysis were performed using the .10 level of significance.

Results

Sources of information. This section of the questionnaire consisted of questions about the types of newspapers and magazines that the students read, their attitudes toward reading and watching television, and the amount of time they spent reading and watching television. The students were asked which of 10 types of newspapers and magazines they usually read (e.g. local and large city newspapers, news magazines, sports magazines, etc.). As Table 1 indicates, although both groups increased slightly in the number of sources of

---

Insert Table 1 About Here

---

information, there was no significant difference in the amount of increase between the two groups. The students were asked if they like to read books. Table 2 indicates that more students in the control group responded positively

---

Insert Table 2 About Here

---

after the program. However, when asked the number of hours per week that they read, Table 1 indicates that no differences were found in the responses between the groups. Since this question was not asked before the program, the responses given after the program were compared. The students were also asked if they liked to watch television. Table 2 indicates that more students in the control group responded positively after the program. Table 1 indicates that, after the program, the number of hours of television watched per week decreased for both groups. However, there was no significant difference in the amount of decrease between the two groups.

School-Related Activities This section of the questionnaire consisted of three parts. The first part consisted of seven questions requesting a response on a Likert-Type scale from 1 (almost never) to 4 (almost always). The questions referred to how often a school-related task was accomplished (e.g. How often do you get your school work done?, etc.). The responses were recorded so that a high score (maximum of 28) indicated that the tasks were almost always completed. Table 1 indicates that both groups decreased in the frequency of completing school tasks. The BioPrep group decreased significantly more than the control group.

The second part consisted of five questions also requesting a response on a Likert-Type scale from 1 (almost never) to 4 (almost always). The questions referred to behavior that reflects self-reliance (e.g. How often are you allowed to go out at night?, How often do you buy your own clothes?, etc.) The responses were recorded so that a high score (maximum of 20) indicated that self-reliant behaviors were almost always allowed. Table 1 indicates that both groups increased in the frequency of self-reliant behavior, but there was no significant difference between the groups in the amount of increase.

The final part asked the student to rate his/her prospects for going to college on a Likert-type scale from 1 (Excellent) to 4 (Poor). Table 3 indicates that more students in the BioPrep program thought that their

---

Insert Table 3 About Here

---

prospects for going to college were better after the program than before.

Family Relationships This section of the questionnaire consisted of two

parts. The first part contained seven questions also requesting a response on a Likert-Type scale from 1 (almost never) to 4 (almost always). The questions referred to religious behavior (e.g. How often do you attend religious services?, How often do take part in religious activities?, etc.) The responses were recorded so that a high score (maximum of 28) indicated that religious behaviors were almost always accomplished. Table 1 indicate that both groups decreased in the frequency of religious behavior and that there was no significant difference between the groups in the amount of decrease.

The second part contained five questions also requesting a response on a Likert-Type scale from 1 (almost never) to 4 (almost always). The questions referred to behavior that reflected interaction between the student and his/her parent (e.g. How often do you go to your parents when you need help with school work?, etc.) The responses were recorded so that a high score (maximum of 20) indicated frequent amounts of student-parent interaction. Table 1 indicates that both groups decreased in the frequency of student-parent interactions and the BioPrep group decreased significantly more than the control group.

Health Care This section of the questionnaire concerned the students' attitude toward health care professionals. It consisted of seven questions also requesting a response on a Likert-Type scale from 1 (strongly agree) to 5 (strongly disagree). The questions referred to attitudes toward the health care field and health care professional (e.g. Doctors take a real interest in their patients, etc.) The responses were recorded so that a high score (maximum of 35) indicated a negative attitude toward health care. Table 1 indicates that the BioPrep group had a slight decrease in negative attitudes while the control group had a slight increase. However, there was no

significant difference between the groups in the amount of change.

Careers This section of the questionnaire consisted of seven questions also requesting a response on a Likert-Type scale from 1 (strongly agree) to 5 (strongly disagree). Table 4 shows the results of the responses to the

---

Insert Table 4 About Here

---

questions. As the table indicates, the only significant difference in the program is to the statement "Schooling is more important for getting a good job than enriching life." More students in the BioPrep Program changed their attitude about this question (in either direction) than the control group.

Rural Living This section consisted of six questions also requesting a response on a Likert-Type scale from 1 (strongly agree) to 5 (strongly disagree). The questions referred to attitude toward rural living (e.g. People are friendlier in this area than in a large city, etc.). The responses were recorded so that a high score (maximum of 30) indicated a negative attitude toward rural living. Table 1 indicates that both groups increased in negative attitudes and that there was no significant difference between the groups in the amount of increase.

Discussion

The overall results of the analysis do not support a strong advantage for either the BioPrep group or the control group. The intervention experienced by the BioPrep group was designed so that the major emphasis was placed on academic outcomes, which may explain why there were so few significant differences in its favor. Field trips, guest speakers, audiovisual

presentations and the like seemingly did not produce a significantly strong influence to differentially change students' behaviors and attitudes. In addition, the four-year period of time from the beginning of grade nine through grade twelve is a period of constant change in the lives of adolescents and emerging adults. With so many outside variables competing for attention, it is difficult to devise a program that will change attitudes permanently, or to develop measures sensitive enough to measure the change that may occur. Finally maturation may have had much to do with the outcomes. For example, it is expected that teens in the process of maturing become more self-reliant, and spend less time in religious activities and watching television.

Participation time in the BioPrep program may have presented a problem for students in other areas of their lives during the project. Paradoxically, time spent in the program activities may well have taken time away from other school-related activities, outside reading, TV watching, and student-parent interaction. It is not clear from the data presented here what positive effects the specific program activities had on the subjects' behaviors and attitudes. A more in-depth evaluation, with specific measures for specific intended outcomes is suggested for future cycles of the program.

References

Knopke, H.J. and Northrup, R.S. (1985). BioPrep: A case study in educational change. Paper presented at the Southeast Regional Association of the American Educational Research Association, Section G, Social Context of Education, Tallahassee, Florida, March 14-16, 1985.

Knopke, H.J., Hartman, J.S. and Northrup, R.S. (1986). Selected student outcomes in a premedical education program conducted in rural high schools. Paper presented at the fifth annual conference on Rural Education, Las Cruces, New Mexico, February, 14, 1986.

Knopke, H.J., Northrup, R.S. & Hartman, J.S. (1986). BioPrep: A premedical program for rural high school students. Journal of The American Medial Association, 256(18), 2548-2551.

Table 1

Results of t-tests

Variable	BioPrep N	Before Mean	Before SD	After Mean	After SD	Change Mean	Change SD	Control N	Before Mean	Before SD	After Mean	After SD	Change Mean	Change SD	t	df	p
No. of Sources of Information	92	3.80	1.54	4.21	1.59	.40	.64	73	3.78	1.42	4.48	1.64	.70	1.49	-1.22	163	.23
No. of Hrs. per Wk. Spent Reading	77	Not Available		10.96	7.11	Not Available		60	Not Available		11.62	9.35	Not Available		- .47	135	.64
No. of Hrs. per Wk. Spent Watching TV	86	31.47	19.43	22.97	13.44	-8.40	20.39	53	31.40	13.21	23.82	11.36	7.40	11.81	- .32	137	.75
School Tasks	87	20.85	2.61	19.93	2.71	- .91	3.08	66	19.91	2.62	19.80	2.72	- .11	2.81	-1.68	151	.09 *
Self-Reliant Behavior	93	13.20	2.28	15.71	2.34	1.96	2.59	74	12.93	2.33	15.09	2.29	2.16	2.69	- .47	165	.64
Religious Behavior	93	11.47	3.53	10.74	3.40	- .73	2.70	73	12.33	3.11	11.68	3.30	- .64	2.57	- .46	164	.65
Student-Parent Interaction	93	7.83	2.06	6.53	1.80	-1.30	2.22	73	6.86	2.07	6.13	1.69	- .72	2.06	-1.71	164	.09 *
Health Care Attitudes	94	19.72	2.78	19.58	2.76	- .13	.71	70	19.00	2.21	19.57	2.95	.57	3.55	-1.23	162	.22
Rural Living Attitudes	90	16.76	2.57	16.92	2.39	.16	3.40	73	16.14	2.62	17.04	2.29	.90	2.93	-1.47	161	.14

Table 2

Chi-Square Analysis - Yes and No responses

Question	Group	Yes Before No After	Same Before and After	No Before Yes After	x^2	df	p
"Do you like to read books?"	BioPrep	10	75	16			
	Control	9	54	26	5.115	2	.08 *
"Do you like to watch television?"	BioPrep	5	87	9			
	Control	4	63	22	8.679	2	.01 *

Table 3

Chi-Square Analysis - Excellent to Fair responses

Question	Group	Better Before	Same Before and After	Better After Yes After	x^2	df	p
What do you think your prospects are for going to college?	BioPrep	25	47	29			
	Control	36	32	21	5.375	2	.07 *

Table 4

Chi-Square Analysis - Strongly Disagree to Strongly Agree Responses

Statement	Group	Agreed More Before	No Change	Agreed Less Before	X^2	df	p
Once someone chooses a career, they cannot choose another	BioPrep	21	52	21			
	Control	13	36	24	2.39	2	.30
It is as easy to be successful in one occupation as another	BioPrep	33	31	30			
	Control	22	26	25	.46	2	.80
People should not worry about choosing a career until they are out of school	BioPrep	26	45	23			
	Control	15	37	21	1.20	2	.55
People should choose an occupation that allows them to help people	BioPrep	18	35	41			
	Control	19	31	23	2.73	2	.25
Schooling is more important for getting a good job than enriching life	BioPrep	34	18	41			
	Control	21	26	26	5.56	2	.06 *
High school is enough education for preparing for a good career	BioPrep	11	11	71			
	Control	6	14	52	2.13	2	.35
It is more important to teach students work skills than how to get Along	BioPrep	24	44	25			
	Control	15	30	28	2.52	2	.28